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July 9, 2012

Ed Randolph
California Public Utilities Commission
Energy Division Director
505 Van Ness Avenue
San Francisco, CA 94102

Re: Seismic Research Projects for San Onofre Nuclear Generating Station (SONGS)

Dear Mr. Randolph:

In accordance with Decision (D.) 12-05-004, Southern California Edison Company (SCE) respectfully submits for your review and comments its plans for SONGS seismic research projects. Table 1 in the enclosed document lists the plans provided in this submittal. As indicated in the table, SCE will submit plans for other research projects as SCE finalizes those plans.

Should you have any questions regarding this submittal, please feel free to contact me at 949-368-3540.

Sincerely,

Caroline McAndrews, Director
Nuclear Strategic Projects
San Onofre Nuclear Generating Station
Southern California Edison

P.O. Box 128
San Clemente, CA 92674-0128

SOUTHERN CALIFORNIA EDISON

SAN ONOFRE NUCLEAR GENERATING STATION

SEISMIC RESEARCH PROJECTS

This document outlines Southern California Edison's (SCE) plans for performing the San Onofre Nuclear Generating Station (SONGS) Seismic Research Projects (i.e., geological, geodetic, and geophysical surveys). SCE developed these plans with the assistance of various agencies, academia, and consultants. The seismic research projects will provide new geologic and seismic information relevant to SONGS' tectonic and seismic setting.[1] This information will be obtained by conducting specific research that updates existing seismic source data.

The seismic research projects have been designed to capture the most relevant seismic source data, both in space and time, for the Newport-Inglewood/Rose Canyon Fault (NI/RC) and the "hypothesized Oceanside Blind Thrust" (OBT) Fault.[2] The NI/RC Fault is the controlling fault for SONGS and additional information is desired to better understand the existence and characteristics of the OBT Fault. Specifically, these projects will identify the level of activity and history of the NI/RC and OBT faults. For example, these projects will consider specific fault locations, geometries, fault types, slip rates, recurrence intervals, and potential earthquake magnitudes. The results from the onshore and offshore projects are intended to provide additional data concerning the seismic setting surrounding SONGS.

Not all seismic research projects have yet been planned, and for those that have been, short descriptions have been developed and are presented in Table 1. For those projects that have not yet been planned, only the descriptive title of the project is presented in Table 1. A summary schedule for the seismic research projects is provided in Figure 1.

Project Management

SCE is managing the project and coordinating with a number of agencies, academia, and consultants to initiate and complete the seismic research projects.

Project Support

Each project is supported by a mix of the following agencies, academia, and consultants:

- GeoPentech
- Padre (permits)
- Lamont Doherty Earth Observatory
- GeoTrace (geophysical data processing)
- NodalSeismic (geophone data collection)
- GEOVision (onshore 3D)
- Earth Consultants International (onshore)
- SDSU (paleoseismic)
- UNAVCO (GPS)
- Scripps (seismology)

Offshore Technical Leaders include:

- Neal Driscoll, Scripps
- Peter Shearer, Scripps
- Steve Wesnousky, UNR
- Graham Kent, UNR
- Frank Vernon, Scripps

[1] Seismic setting is defined as the identification of credible earthquake sources by studying past earthquake activity recorded by local surface and subsurface structures.
[2] The existence of the OBT Fault is unknown and further research is required.

Offshore Peer Review from, as available:

- Holly Ryan, USGS
- John Shaw, Harvard
- Mark Legg, Legg Geophysical
- Christopher Sorlien, UCSB

Onshore Technical Leaders include:

- Tom Rockwell, SDSU
- Lisa Grant Ludwig, UCI
- Frank Vernon, Scripps
- Karl Mueller, University of Colorado
- Ray Weldon, University of Oregon
- Peter Shearer, Scripps

Onshore Peer Review from, as available:

- James Dolan, USC
- Kathryn Hanson, AMEC
- Dan Ponti, USGS
- Roy Shlemon, Private Consultant

Table 1 – Seismic Research Projects Summary

Project #	Project	Project Description
1	Historical Marine Geophysical Data Reprocessing and Reanalysis	This project will update seismic source data within the area of interest associated with the NI/RC and OBT faults by reprocessing and reanalyzing existing seismic reflection data collected by SCE, USGS, the petroleum industry, and academia. The data will be used to optimize the planning of future marine geophysical surveys in focused areas and depths within the area of interest associated with the NI/RC and OBT faults. The data will support the environmental permitting processes for those projects.
2	2D Deep Marine Seismic Reflection Surveys	This project will collect and process 2D deep marine multi-channel seismic and other geophysical data for the area that encompasses the portion of the Newport-Inglewood/Rose Canyon (NI/RC) Fault relevant to the seismic setting surrounding SONGS, and its potential intersection with the OBT Fault. The data will be used to evaluate the location and geometry of the potential intersection of the NI/RC Fault and OBT Fault in the area offshore of SONGS, unless the contrast between the faults and the flanking bedrock does not facilitate imaging with modern marine geophysical methods. The portion of the deep marine geophysical data west of this potential fault intersection, or above the bedrock, will be used to define potential rupture area parameters for the NI/RC and OBT faults. The data will support evaluation of deep geologic stratigraphy, folding, and faulting below the ridges and basins defined by the bathymetry. The data may also establish the seismic velocity parameters in the underlying geologic materials, which support interpretation of the resulting marine geophysical data and establish locations and depths of offshore earthquakes.
3	GPS Monitoring	This project will install and monitor continuous GPS stations in the region surrounding SONGS to observe crustal deformation patterns and regional strain accumulation. The data will be used to evaluate slip rates and activity of the NI/RC and OBT faults.

Table 1 – Seismic Research Projects Summary (Continued)

Project #	Project	Project Description	
4	3D Deep Marine Seismic Reflection Surveys	To be provided in a future submittal.	
5	2D Shallow Marine Seismic Reflection Surveys	To be provided in a future submittal.	
6	3D Shallow Marine Seismic Reflection Surveys	To be provided in a future submittal.	
7	Seafloor Surveys	To be provided in a future submittal.	
8	Sea Floor Sediment Sampling and Age Dating	To be provided in a future submittal.	
9	Onshore and Offshore USGS CRADA Investigations	To be provided in a future submittal.	
10	Marine Terrace and Coastal Deformation Investigations	To be provided in a future submittal.	
11	Paleoseismic Trenching	To be provided in a future submittal.	
12	Seismic Monitoring	Onshore	To be provided in a future submittal.
		Offshore	To be provided in a future submittal.

Figure 1 – Schedule of Activities

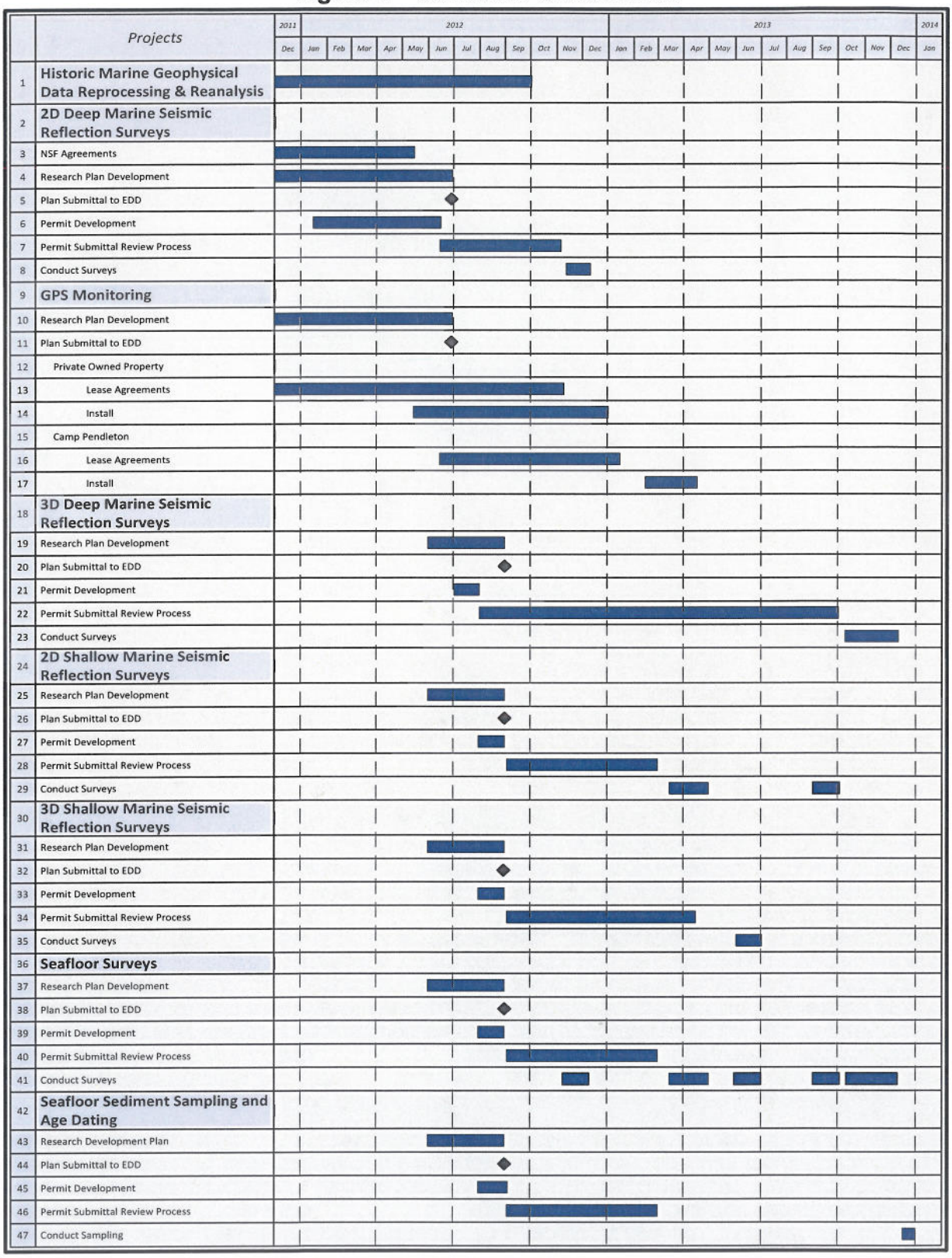
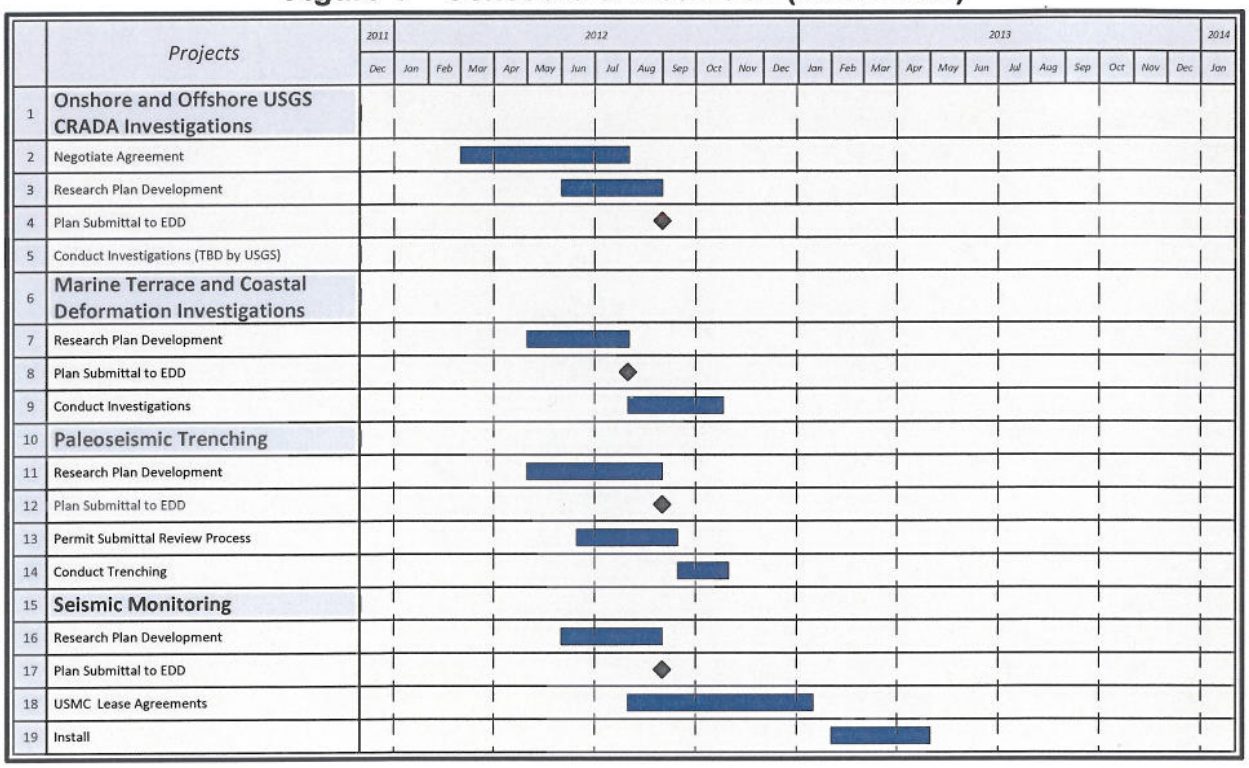


Figure 1 – Schedule of Activities (Continued)



1	Historical Marine Geophysical Data Reprocessing and Reanalysis
2	2D Deep Marine Seismic Reflection Surveys
3	GPS Monitoring
4	3D Deep Marine Seismic Reflection Surveys
5	2D Shallow Marine Seismic Reflection Surveys
6	3D Shallow Marine Seismic Reflection Surveys
7	Seafloor Surveys
8	Sea Floor Sediment Sampling and Age Dating
9	Onshore and Offshore USGS CRADA Investigations
10	Marine Terrace and Coastal Deformation Investigations
11	Paleoseismic Trenching
12	Seismic Monitoring
13	
14	
15	

Objective

This project[1] will update seismic source data within the area of interest associated with the Newport-Inglewood/Rose Canyon (NI/RC) and "hypothesized Oceanside Blind Thrust" (OBT) faults by reprocessing and reanalyzing existing seismic reflection data collected by SCE, USGS, the petroleum industry, and academia. This project will also support environmental permitting activities, such as providing input to the federal environmental permitting process, including the extent of the survey area and location of ship tracks, and input to the California Coastal Commission (CCC) to secure compliance with the federal permits.

Scope of Work

The historical marine geophysical data reprocessing and reanalysis project includes the following activities:

1. Identify relevant existing seismic data in the area offshore SONGS. Assess the shallow and deep marine geophysical data quality, availability, and uncertainty as well as the more recently collected shallow geophysical data in the area offshore SONGS.
2. Digital data were evaluated for reprocessing and only the Chevron data[2] are in the appropriate format for using modern processing software and techniques. These data will be combined with existing high quality data to define better the offshore seismic setting. The reprocessing of historic seismic data includes the following steps:
   - Reconstruct the configuration of the seismic equipment used to collect the seismic reflection data survey using information in the header files and back calculation analysis.
   - Reformat original shot data files to facilitate modern reprocessing. This process involves removing auxiliary traces, renumbering Common Mid-Point (CMP) traces, disaggregate odd and even CMP traces, and reassemble CMP traces into final, fixed geometry.
   - Sample, stack, and migrate data.
   - The reprocessing will be performed using SIOSEIS processing software. SIOSEIS is a software package for enhancing and manipulating marine seismic reflection data, sponsored by the National Science Foundation (NSF) and the Scripps Industrial Associates.
3. Reanalyze the reprocessed seismic reflection data together with the older processed seismic reflection data (both analog and digital). The reanalysis of the historic seismic data includes the following steps:
   - Import (1) reprocessed digital seismic data, (2) available processed digital seismic data, and (3) digitized pertinent analog seismic records into Kingdom Suite 3D software using available shot point location files.
   - Digitize geologic layers on seismic records including: (1) acoustic basement, (2) sedimentary rock layering, and (3) faults.
   - Produce maps and cross-sections.

[1] A.11.04-006, Geophysical Data Reanalysis.
[2] See "Table 1 Historical Seismic Surveys.xlsx" provided on CD, tab "Table Marine Survey," lines 53-56.

4. These data will be used, in large part, to support the following environmental permitting activities:
   - Provide input to the federal environmental permitting process, including extent of the survey area and location of ship tracks.
   - Provide input to the California Coastal Commission to secure compliance with the federal permits.

1. Identify Relevant Existing Seismic Reflection Surveys

Seismic reflection surveys were identified by members of the project support team[3] and are provided on CD. As listed, eighty (80) existing marine geophysical surveys, comprising over 1,000 seismic reflection lines, were collected between 1968 and 2011 by the petroleum industry, USGS, SCE, and academia. Fourteen (14) of the identified surveys are available in digital processed format (i.e., can be entered into Kingdom Suite). Eighteen (18) of the identified surveys are only available in analog format (i.e., paper or scanned copies). Data for the remaining surveys identified, forty-eight (48) total, were not available in either digital or analog formats.

Figure 1 shows ship tracks of the available digital processed seismic reflection surveys offshore SONGS. Two (2) of these identified digital surveys are available in the appropriate data format for reprocessing, as described in more detail below. Eleven (11) of these available digital surveys penetrated deep enough to detect the region of interest. Reflectors observed in the legacy seismic data and surficial deformation have been proposed as evidence for the OBT Fault (Rivero et al., 2000); however, there is uncertainty regarding this interpretation and the reflectors may just record large density contrasts in the subsurface or be artifacts of the data processing.

[3] Refer to the Introduction for a list of individuals supporting this effort.

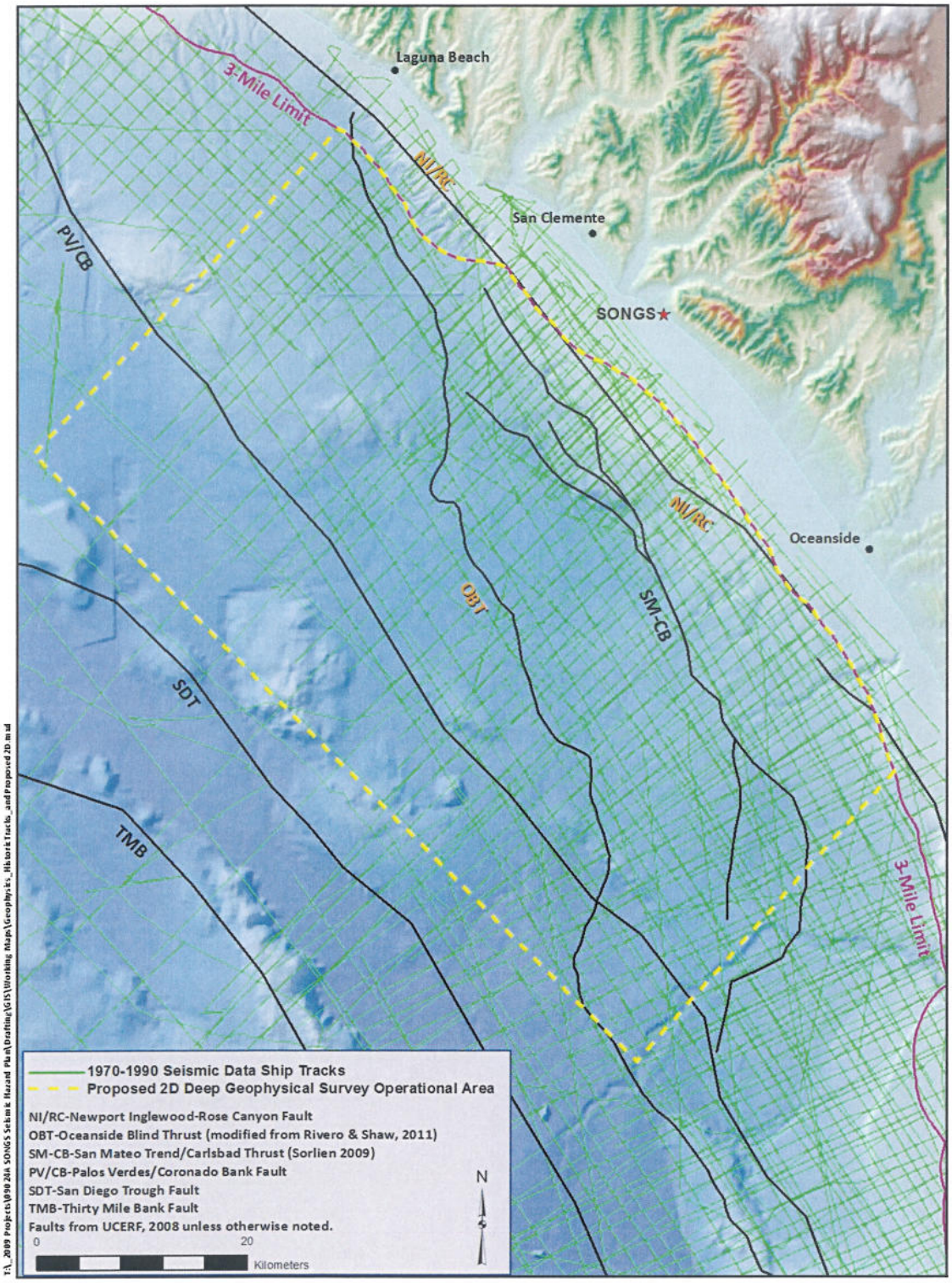


Figure 1. Ship track locations for available digital seismic reflection data

2. Reprocess Appropriate Historic Seismic Data Using Modern Methods

The historic seismic data was processed using vintage methods and computers with relatively lower computing power. The resolution and hence the reliability of interpretation of existing historic reflection records can be improved using modern processing software and techniques. Figure 2 illustrates the resolution enhancement that may be gained by reprocessing the vintage geophysical records using modern techniques.

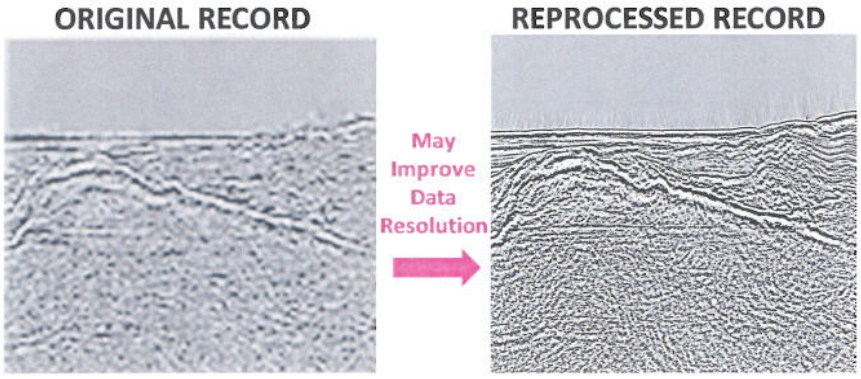


Figure 2: An illustration of how seismic data resolution may improve using modern reprocessing

The historic seismic data must be available in an appropriate data format to perform the reprocessing. For the reprocessing, the seismic data must be (1) digital and (2) unprocessed (i.e., raw data "off the boat"). As discussed above, the majority of the digital data is only available as processed data so reprocessing using modern methods is precluded. There are about thirty (30) seismic lines from two (2) 1979 Chevron surveys (H-17-79-SC and H-18-79-SC) that are available in the appropriate digital format. A portion of one of these seismic lines was reprocessed for a feasibility study. Based on this study, it was concluded that reprocessing improved the resolution of the near-surface geology; however, due to limitations of how the seismic data were acquired 30+ years ago, significant improvement to the deep imaging is not possible.

3. Reanalyze Historic Seismic Data using Modern 3D Visualization Software

Reanalysis of the historical seismic reflection data is ongoing using modern visualization software where the data can be viewed in 3-dimensions to improve analysis of geologic structures. The seismic data visualization is being performed using the software program Kingdom Suite. Figure 3 shows modern 3D visualization of seismic records using the Kingdom Suite software.

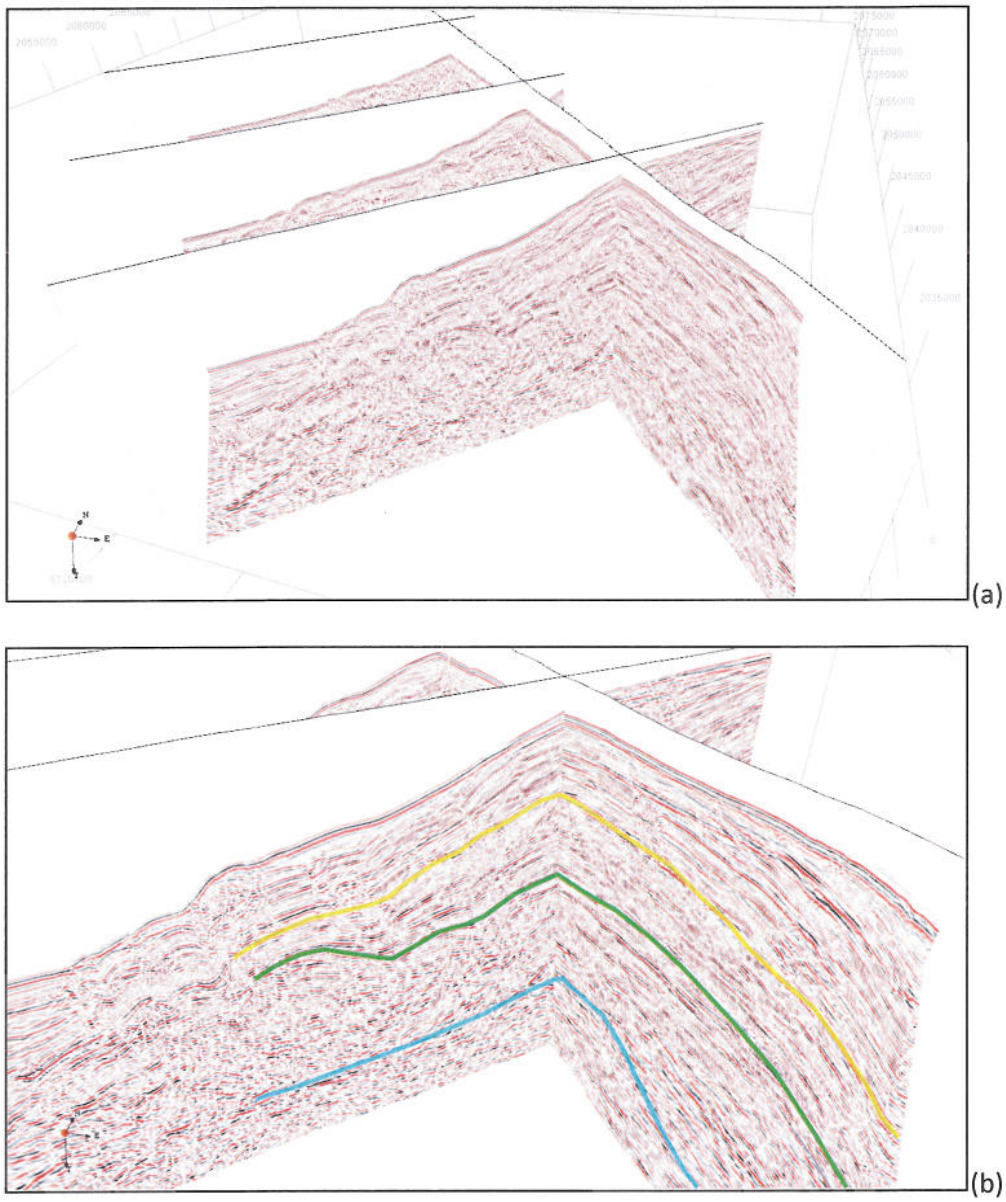


Figure 3. (a) 3D visualization of typical seismic records within Kingdom Suite; (b) Digital interpretation of 3D geologic layering using Kingdom Suite

4. Permitting Activities

Existing vintage seismic data and reprocessed data may help optimize the 2D deep survey location and size. Minimizing the survey area and time in the marine environment reduces the time required for permit approval and the associated environmental impacts.

Prerequisites

- None

Project Risks with Mitigation Plan

- Reprocessing vintage seismic reflection lines may not improve the resolution of the vintage data and thus will not remove the uncertainty of the vintage data and improve the reliability of interpretations developed solely on the legacy data. Mitigation: If reprocessing does not improve data resolution, original processed seismic reflection data will be used for reanalysis, with the vintage data resolution and limitations recognized and documented.
- May not have all relevant data. Mitigation: Contacting regional geophysical experts to ensure that relevant data are included in the analysis.

Specific Deliverables (Results)

- Kingdom Suite 3D model that includes: (1) reprocessed digital seismic data, (2) available processed digital seismic data, and (3) digitized pertinent analog seismic records.
- Maps and cross-sections appropriate to support planning and permitting.

File provided on CD

- Table of Historical Seismic Surveys Completed Offshore of SONGS (file name: Table 1 Historical Seismic Surveys.xlsx)

Objective

This project[1] will collect and process 2D deep marine multi-channel seismic and other geophysical data for the area that encompasses the portion of the Newport-Inglewood/Rose Canyon (NI/RC) Fault relevant to the seismic setting surrounding SONGS, and its potential intersection with the "hypothesized Oceanside Blind Thrust" (OBT) Fault.

Scope of Work

The 2D deep survey includes the following activities:

1. Determine the study target area.
2. Deploy ocean bottom seismometers (OBS) and onshore geophones (or nodes) before the marine survey to collect seismic refraction data.
3. Collect 2D deep seismic reflection survey data within the survey area.
4. Perform Quality Assurance/Quality Control (QA/QC) on raw and processed 2D deep reflection data, including new 2D deep seismic refraction data.
5. Interpret the 2D deep seismic reflection data and update the SONGS seismic source database.
6. Determine if the 3D deep reflection survey is warranted (i.e., determine whether the OBT Fault can be imaged when encased in the Catalina Schist).

Deep marine geophysical seismic reflection surveys image sediment and rock layers beneath the seafloor. To image the deep (up to 8 to 12 kilometers or 5 to 7.5 miles) structure beneath the seafloor offshore SONGS requires a ship outfitted with a high-energy, low frequency sound source and sophisticated recording instruments. Due to the high energy source required for deep seismic penetration, the survey requires compliance with the National Environmental Policy Act (NEPA) and federal permit approvals.

In seismic reflection surveys, sound wave energy is mechanically generated near the sea surface through a sophisticated process that generates an array of bubbles that subsequently collapses, producing a sound source that is directed toward and into the seafloor. This energy is reflected back to the surface from different layers of rock with contrasting acoustic impedance (density x velocity) between the layers. Sensitive measuring devices (hydrophone arrays) record the amplitude and arrival time of the returning sound waves. The hydrophones are towed behind the ship in a long cable called a streamer. The number and spacing of the hydrophones in the streamer varies depending on the objectives of the survey. The data recorded by the hydrophones is processed to generate images of the sub-seafloor structure, which allow us to define the offshore seismic setting.[2] A densely sampled wavefield is needed to accurately image features in the subsurface through a process called seismic migration.

2D seismic reflection surveys provide a regional understanding of the geologic structure and are usually performed first to define potential 3D survey area. This sequenced approach minimizes time in the marine environment (environmental impact) and associated costs. It also removes uncertainty regarding the 3D survey imaging capabilities.

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[1] A.11-04-006, Deep 2D/3D Marine Seismic Reflection Mapping (2D only provided with this submittal).

[2] Seismic setting is defined as the identification of credible earthquake sources by studying past earthquake activity recorded by local surface and subsurface structures.

Even though deep reflection surveys have lower vertical resolution, they can penetrate on the order of 8 to 12 kilometers (~ 5 to 7.5 miles) below the seafloor, which is the depth necessary to evaluate the deep margin structures and interaction of the NI/RC and OBT faults (Figure 1).

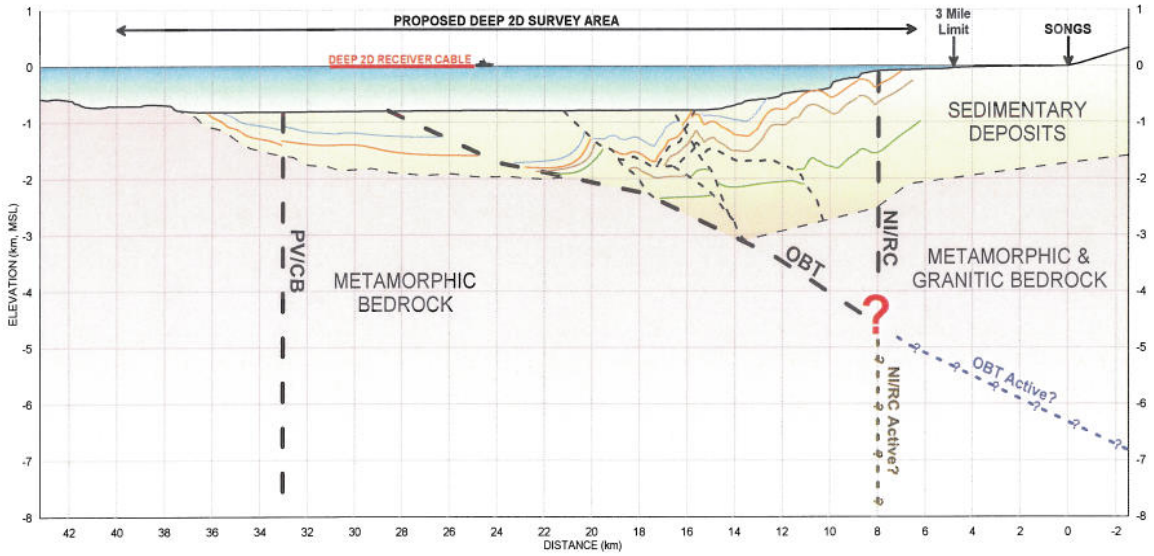

Figure 1. Schematic of geologic structures showing a generalized profile of the project area including: (1) proposed 2D deep survey area, (2) NI/RC Fault and the OBT Fault potential intersection, (3) sedimentary deposits and associated deformation, and (4) metamorphic/granitic bedrock

1. Determination of Study Target Area

Based on previous ground motion and fault studies, members of the Offshore Technical Leader Team[3] defined the location and size of the 2D seismic survey area. This survey area was then reviewed by an Offshore Peer Review Team[4] to ensure the survey area encompasses the NI/RC and the OBT faults (as mapped by Rivero and Shaw, 2011). The survey area also includes the trace of the San Mateo and Carlsbad faults (as mapped by Christopher Sorlien, et. al., 2009) and other faults (as mapped by UCERF, 2009). The 2D deep seismic reflection survey will be completed over the area shown in Figure 2.

[3] Graham Kent, UNR; Neal Driscoll, Scripps
[4] John Shaw, Harvard; Holly Ryan, USGS; Mark Legg, Legg Geophysical; Christopher Sorlien, UCSB

2. Deploy/Retrieve Ocean Bottom Seismometers (OBS) and Onshore Geophones
OBS and onshore nodal geophones will be deployed along linear arrays, as shown in Figure 2, to collect long-offset seismic refraction data. This data may define the onshore-offshore seismic velocity structure and place important constraints on margin geometry and deformation associated with the potential intersection of the NI/RC and OBT faults.

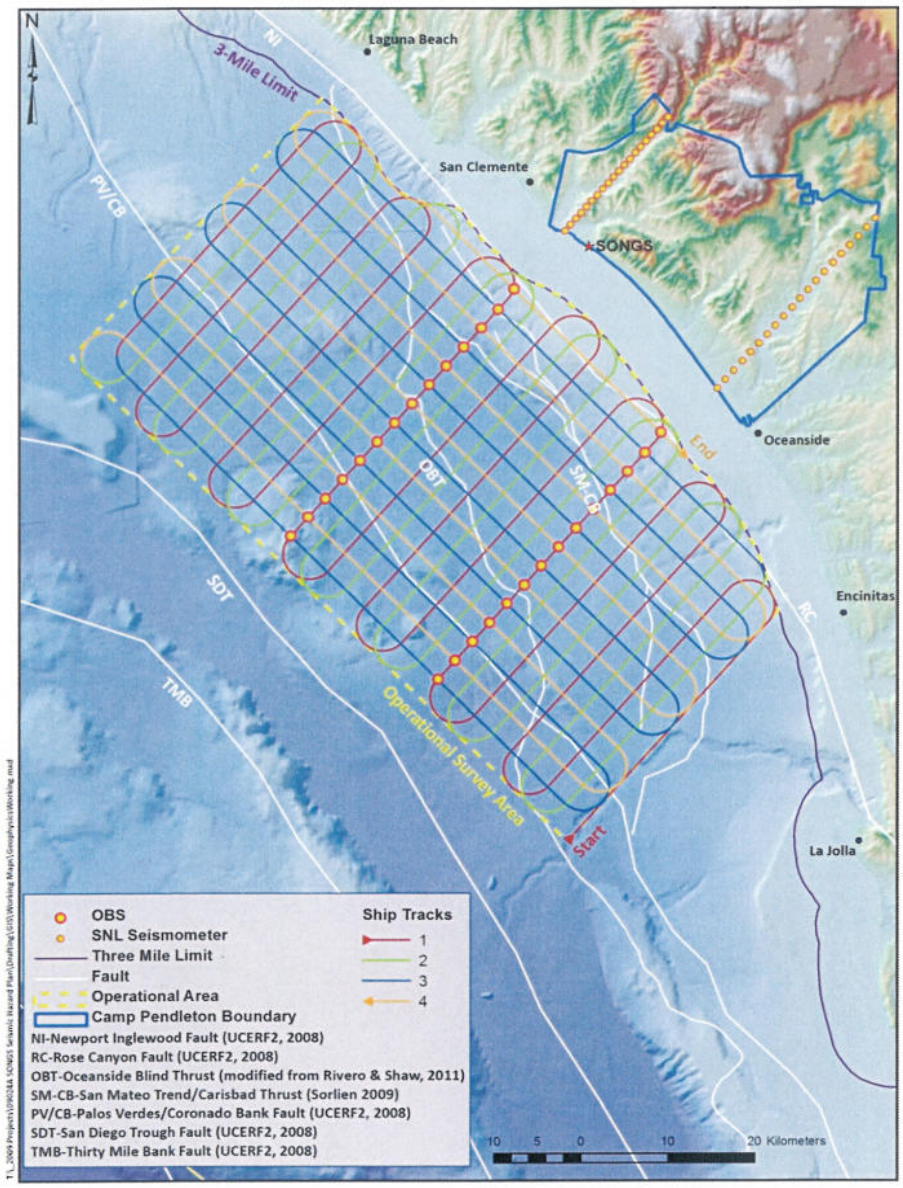

Figure 2. 2D deep survey ship track lines and location of temporary ocean bottom seismometers and onshore geophones (2D deep surveys will be performed entirely in federal waters)

The *R/V Sproul,* which is owned and operated by Scripps Institution of Oceanography, will deploy and retrieve the temporary OBS instruments. The temporary OBS units are self-contained and will remain in-place for the duration of the survey.

Onshore seismometer units will be temporarily installed on wireless strings as shown in Figure 2. Each "string" will span 10 to 20 km (6.2 to 12.4 miles) inland from the coast along roughly the same trend as the offshore OBS units. Each string will contain 20 to 60 seismometer units; only 20 are shown in Figure 2 for clarity.

3. Collect 2D Deep Seismic Reflection Data

The 2D deep seismic reflection data will be acquired using the *R/V Marcus G. Langseth.* The vessel is operated by Lamont-Doherty Earth Observatory and is owned by the National Science Foundation. Vessel speed during data collection will range from 4 to 5 nautical miles per hour (knots). A second vessel, the *R/V Sproul,* will provide support for the *R/V Langseth.*

The sound source will be provided by the discharge of air gun arrays consisting of 2 strings of 9 individual air guns, with an air displacement capacity of 3,300 cubic inches. The hydrophone streamer will be configured at a length of 6,000 meters with hydrophones spaced at 12.5 meter increments along the cable; seismic reflection data will be streaming up the cable in real time.

4. Perform QA/QC on Raw and Processed 2D Deep Seismic Reflection Data

GeoTrace (an industry geophysical processing company based in Houston, TX) was involved in the survey design and will participate on the cruise to ensure data quality and that the proposed targets will be imaged properly through shore-based processing procedures. Data QA/QC will be performed in real time on the vessel. Following the cruise, the 2D seismic reflection data will be processed by GeoTrace.

5. Interpret New 2D Deep Seismic Reflection Data

The processed 2D deep seismic reflection data will undergo geophysical interpretation and will be assembled to produce updated seismic setting data.

6. Determine if 3D Deep Seismic Reflection Survey is Warranted

The 2D deep seismic reflection data will provide important decision or exit points for the 3D deep seismic reflection survey. If the OBT Fault can be imaged within the Catalina Schist, the 2D data will then be used to define the location and size of the 3D deep survey. If the OBT Fault cannot be imaged by 2D deep seismic reflection surveys, then the 3D deep seismic survey will also not be able to image the Fault and therefore will not be conducted.

Prerequisites

- A review pursuant to the NEPA needs to be performed. As part of the NEPA process, the National Science Foundation (NSF) will be the federal lead agency and prepare an Environmental Assessment (EA) for the proposed survey.
- The following permits will be secured following the NEPA process:
    - The National Marine Fisheries Service (NMFS) will be required to issue an Incidental Harassment Authorization (IHA) due to the potential impacts to marine species, including marine mammals and sea turtles. Approval of an IHA is required for compliance with the Endangered Species Act (ESA) and the Marine Mammal Protection Act (MMPA).
    - A 404 Permit will be required from the Army Corps of Engineers in compliance with the Clean Water Act for the placement of the OBS's on the sea floor.
    - Review of the federal permits by the California Coastal Commission (CCC) will be required under the requirements of the Coastal Zone Management Act (CZMA).
- *R/V Langseth* (or similar industry vessel) and *R/V Sproul* must be available.
- Surveys need to occur during certain time periods to mitigate environmental impacts (optimal window is October and November).

Project Risks with Mitigation Plan

- The 2D deep seismic reflection survey does not image the OBT Fault where it is encased in Catalina Schist. Mitigation: The marine geophysical data collected west of the potential intersection and the onshore investigations (i.e., marine terrace studies, trenching, global positioning system, and seismic monitoring) may define the geometry, style, and other seismic source characteristics of faults important to the site.
- Due to weather, mammal migration season, or other unforeseen events, the 2D deep reflection surveys may not be completed. Mitigation: Perform survey during another season, or reschedule other surveys with lower energy sources to this time period.
- Environmental incidents may occur while collecting seismic reflection data using large vessels and seismic sources. Mitigation: Exercise policies developed by permitting agencies.
- The *R/V Langseth* (or similar industry vessel) may not be available. Mitigation: It may be possible to schedule a private industry vessel at a significant cost increase.

Specific Deliverables (Results)

- Digital raw and processed data will be made publicly available and will be archived at Scripps/UNR as well as seismic archives at Lamont and UTIG.
- A report including maps and geologic cross-sections as well as a Kingdom Suite 3D interpretation.

Files provided on CD

1. Environmental Assessment (EA) of Marine Geophysical Surveys (file name: EA of Marine Geophysical Surveys.pdf)
2. Request for an Incidental Harassment Authorization (IHA) to Allow Incidental Take of Marine Mammals During a Marine Geophysical Survey (file name: Final IHA.pdf)
3. Draft Environmental Assessment for Marine Seismic Survey in the Pacific Ocean off Southern California (file name: Draft EA.pdf)
4. Letter from NSF to Helen Golde, National Marine Fisheries, regarding initiation of formal consultation for marine seismic survey (file name: Letter from NSF to NMF.pdf)

Objective

This project[1] will install and monitor continuous Global Positioning System (GPS) stations in the region surrounding SONGS to observe crustal deformation patterns and regional strain accumulation.

Scope of Work

The GPS monitoring project includes the following activities:

- Determination of GPS station locations.
- Obtain lease agreements and permits to install GPS stations on Camp Pendleton and on private land surrounding SONGS, including offshore platforms.
- Assess data quality for identified stations prior to installation on Camp Pendleton and on private land (i.e., ensure that instrument location will acquire sufficient satellite coverage).
- Purchase materials and install stations on Camp Pendleton and on private land.
- Perform annual analysis of GPS velocities and crustal deformations.
- Provide annual data archiving, operations, and maintenance for installed station.
- Support closure of project and transfer of stations to scientific community (UNAVCO).

Determination of GPS Locations

The installation sites for the proposed GPS stations were selected to obtain better GPS coverage around the fault systems in the region (Figure 1). Site selection was based on developing a uniform grid of instruments across the region, comparable to the station density and distribution both north and south of SONGS and Camp Pendleton. These new stations will become part of the Southern California Integrated GPS Network (SCIGN).

[1] A.11-04-006, GPS Array.

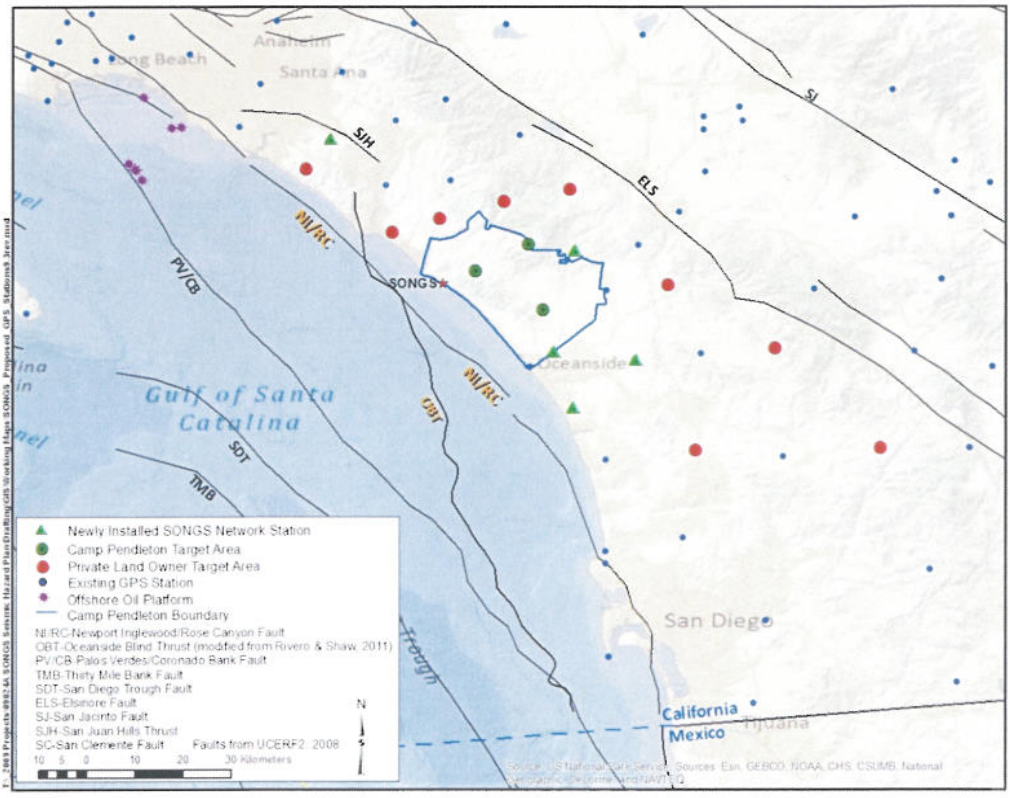

Figure 1. Area Surrounding SONGS showing proposed stations on private land and Camp Pendleton

Prerequisite

Legal access and environmental permits for installations on Camp Pendleton and private property are required.

Project Risks with Mitigation

- If negotiations with private land owners are unsuccessful, and no additional stations are installed, then the coverage will remain limited. Mitigation: Explore placing more stations on Camp Pendleton.
- Property ownership may change requiring removal of installed stations. Mitigation: Negotiate contracts so that stations can be assigned to new owners or relocate stations to nearby property.
- Stations on Camp Pendleton may require additional management and support from SCE staff to comply with Marine Corps base policies and environmental constraints. Mitigation: The project will explore locating stations on private land.

Specific Deliverables (Results)

- Report summarizing station installation and data collection process
- Annual GPS data analysis summary reports starting 2013 through 2015 (3 total)
- Project Closure and Transition Plan to transfer the stations to SCIGN